PATENT ABSTRACTS OF JAPAN

(11)Publication number : 07-125128
(43)Date of publication of application : 16.05.1995

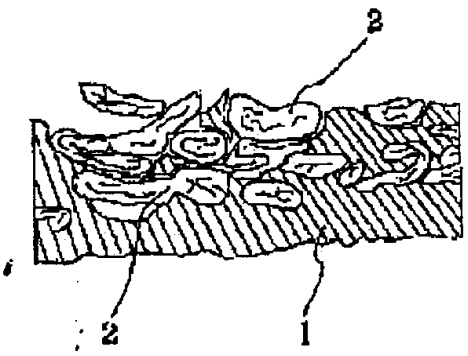
(51)Int.Cl. B32B 5/26
B32B 5/02
D04H 1/48
D04H 3/00
D04H 3/14
D04H 5/02
D04H 5/06

(21)Application number : 05-300904
(22)Date of filing : 05.11.1993

(71)Applicant : UNITIKA LTD
(72)Inventor : YAMAGUCHI SO
NISHIMURA SHIGETAKA
MIYAHARA YOSHIMOTO

(54) BIODEGRADABLE NONWOVEN LAMINATE

(57)Abstract:
PURPOSE: To obtain a biodegradable nonwoven laminate having high separation strength suitable for medical and sanitary use by laminating a nonwoven fabric layer composed of biodegradable thermoplastic synthetic filaments and a nonwoven fabric layer formed of natural fibers being entangled each other.
CONSTITUTION: This structure is formed by laminating two nonwoven fabrics, wherein one is composed of biodegradable thermoplastic synthetic filaments consisting of an aliphatic polyester copolymer obtained by ring-opening polymerization, and the other is composed of natural fibers being mechanically entangled each other. This is also a laminated nonwoven structural body having dotted fusional areas formed of synthetic filaments and natural fibers that are fused one another, in which in the dotted fusional areas, the natural fibers 2 situated at least on the boundary surface of both the nonwoven layers are fixed to be integrated with the synthetic filaments in the form of being buried in its fused parts 1.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

* NOTICES *

CLAIMS

[Claim(s)]
[Claim 1] The nonwoven fabric layer and natural fibers which consisted of a biodegradability thermoplasticity synthesis continuous glass fiber which consists of an aliphatic polyester system polymer obtained by the ring opening polymerization carry out a confounding mechanically. Are laminating non-******** which has the punctiform weld zone where the laminating of the becoming nonwoven fabric layer is carried out, and it comes to weld the aforementioned synthetic continuous glass fiber and a natural fiber, and it sets to the aforementioned punctiform weld zone Biodegradability laminating non-******** characterized by coming to be unified collectively by being fixed where the natural fiber of both the aforementioned nonwoven fabrics layer located in an interface at least is laid under the synchysis section of the aforementioned synthetic continuous glass fiber.
[Claim 2] Biodegradability laminating non-******** according to claim 1 whose aliphatic polyester system polymers obtained by the ring opening polymerization are a Polly epsilon-caprolactone and/or the Polly beta propiolactone.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] A thermoplastic synthesis continuous-glass-fiber nonwoven fabric layer and a natural fiber nonwoven fabric layer are laminating non-********s which come to carry out a laminating, this invention has a biodegradability, and the sublation strong force is high, has absorptivity and a hydrophobic property collectively, and is related with suitable laminating non-******** by wiping off as each material general life relation material, such as cloth, and a wrapping, home use or a bag for raw dust uptakes for business, or for the medicine and hygienic goods, and the industrial materials represented for agriculture.
[0002]
[Description of the Prior Art] From the former, the nonwoven fabric which consists of thermoplastic synthesis polymer fiber, such as polyethylene, polypropylene, polyester, and a polyamide, as a material for the medicine and hygienic goods, general life relation material, or a part of industrial materials is known. Since these nonwoven fabrics consist of stable above polymers chemically under a usual natural environment, they do not have autolysis nature, therefore for disposable intended use, the actual condition is processed by the technique of incineration or reclamation. It is a problem for a great cost to be needed and to produce the pollution by abandonment plastics moreover about incineration processing, etc., considering the viewpoint of nature and living-environment protection. On the other hand, about reclamation, as mentioned above, since the material is chemically stable under the usual natural environment, there is a problem that it is held over a long period of time in soil with the original status. It can consider choosing the nonwoven fabric which consists of a material which has a biodegradability that these problems should be solved. By for example, the viscose-rayon staple-fiber nonwoven fabric and the wet span bond method which are acquired by dry process or the solution dip coating Protein, such as polysaccharide, such as a cuprammonium rayon rayon continuous-glass-fiber nonwoven fabric obtained, a staple-fiber nonwoven fabric which consists of a cellulosic fiber represented by a cotton and hemp, in addition a chitin, cut ****** (****), or atelocollagen, a polypeptide (polyamino acid), The Polly 3-hydroxy butyrate which a microorganism makes from a nature, The nonwoven fabric which consists of a synthetic fiber of synthetic aliphatic polyester, such as the nonwoven fabric and poly-glycolide which consist of a chemical fiber of a natural product called microorganism polyester, such as a Polly 3-hydroxy burr rate and a Polly 3-hydroxy ****** rate, and a poly-lactide, is mentioned. However, although a biodegradability has, since the mechanical strength of the configuration material [itself] of the nonwoven fabric [itself] is low and it has a hydrophilic property, the mechanical-strength fall at the time of water absorption and humidity is remarkable, and since [which is inferior in flexibility] the material itself is non-thermoplasticity further, the nonwoven fabric which consists of the various former rayon fiber, a cellulosic fiber, or a chemical fiber of the aforementioned natural product has the various problems of the grade which does not have a heat adhesive property. Moreover, although the nonwoven fabric which consists of the latter synthetic aliphatic polyester fiber has a biodegradability and a mechanical strength improves, it is difficult to apply to an intended-use field of which combination of flexibility is required, since fine-size-izing is difficult, and since it moreover cannot but depend on a wet-spinning method in respect of a polymer property, if it faces obtaining a nonwoven fabric, and two or more gradual processes are needed and it is going to reduce a manipulation cost, it has the problem require large-scale equipment.
[0003] On the other hand, laminating non-******** to which it comes to carry out the laminating of a thermoplastic synthetic-fiber nonwoven fabric layer and the natural fiber nonwoven fabric layer is known from the former as laminating non-********. For example, laminating non-******** which has the structure which the laminating of the permeability non-heat welding layer which becomes JP,54-24506,B from the permeability heat welding layer which consists of a thermoplastic synthetic-fiber nonwoven fabric, a natural fiber, etc. was carried out, and the heat welding nature matter has been arranged in scattering on a non-heat welding layer, and the fusion zone of the heat welding nature matter and a heat welding layer permeated from both sides of a non-heat welding layer, and carried out adhesion pinching of the aforementioned non-heat welding layer is proposed. However, since, as for this laminating non-********, the laminating of the natural fiber is carried out, although absorptivity is excellent, a thermoplastic synthetic-fiber nonwoven fabric does not consist of a material which has a biodegradability, and it produces a problem which was mentioned above in the case of disposable intended use. And the process which faces this laminating non-******** manufacturing this, and carries out the laminating of a permeability heat welding layer and the permeability non-heat welding layer, The process which discovers the structure which carried out the polymerization of the heat welding nature sheet layer for sinking in on the non-heat welding layer, and

the fusion zone of the heat welding nature matter and a heat welding layer permeated from both sides of a non-heat welding layer by ultrasonic weld processing, and carried out adhesion pinching of the aforementioned non-heat welding layer, When carrying out needing the process which leaves and exfoliates the aforementioned heat welding nature sheet for sinking in in the fusion zone etc. from the viewpoint of a manufacturing technology, it was complicated, and it was a thing also inferior to economical efficiency.

[0004]

[Problem(s) to be Solved by the Invention] A thermoplastic synthesis continuous-glass-fiber nonwoven fabric layer and a natural fiber nonwoven fabric layer are laminating non-********s which come to carry out a laminating, and this invention has a biodegradability, its sublation strong force is high, it has absorptivity and a hydrophobic property collectively, and tends to offer suitable laminating non-******** by wiping off as each material general life relation material, such as cloth, and a wrapping, home use or a bag for raw dust uptakes for business, or for the medicine and hygienic goods, and the industrial materials represented for agriculture.

[0005]

[Means for Solving the Problem] This invention persons reached this invention zealously as a result of the study that the aforementioned technical probrem should be attained. That is, this invention makes the following configurations the summary.

(1) The nonwoven fabric layer and natural fibers which consisted of a biodegradability thermoplasticity synthesis continuous glass fiber which consists of an aliphatic polyester system polymer obtained by the ring opening polymerization carry out a confounding mechanically. Are laminating non-******** which has the punctiform weld zone where the laminating of the becoming nonwoven fabric layer is carried out, and it comes to weld the aforementioned synthetic continuous glass fiber and a natural fiber, and it sets to the aforementioned punctiform weld zone. Biodegradability laminating non-******** characterized by coming to be unified collectively by being fixed where the natural fiber of both the aforementioned nonwoven fabrics layer located in an interface at least is laid under the synchysis section of the aforementioned synthetic continuous glass fiber.

(2) The aforementioned biodegradability laminating non-******** whose aliphatic polyester system polymers obtained by the ring opening polymerization are a Polly epsilon-caprolactone and/or the Polly beta propiolactone.

[0006] Next, this invention is explained in detail. The biodegradability thermoplasticity synthesis continuous-glass-fiber nonwoven fabric layer in this invention is a span bond nonwoven fabric which consists of biodegradability thermoplasticity aliphatic polyester system polymer fiber obtained by the ring opening polymerization. This biodegradability thermoplasticity aliphatic polyester system polymer is polyester which makes a Polly omega-hydroxy alkanoate system a subject, for example, a Polly epsilon-caprolactone, the Polly beta propiolactones, or these copolymers are mentioned. In addition, in this invention, various additives, such as a grinding agent, a pigment, a light stabilizer, a thermostabilizer, and an antioxidant, can be added to the biodegradability thermoplasticity polymer mentioned above within limits which do not spoil the effect of this invention if needed.

[0007] The biodegradability thermoplasticity synthesis continuous-glass-fiber nonwoven fabric layer in this invention is a span bond nonwoven fabric which consists of the aforementioned polymerization length fiber, and although this continuous glass fiber consists of the aforementioned polymer independent, it may consist of a blend object blended within limits to which two or more sorts chosen as others from the aforementioned polymers of polymers which are different from each other do not spoil melt-spinning nature respectively. Moreover, two sorts as which the gestalt of this continuous glass fiber was chosen from the aforementioned polymers of polymers which are different from each other may be allotted to a **** type or a parallel connected type.

[0008] although it comes out about a span bond nonwoven fabric The polymer first mentioned above So that the blend object with which two or more sorts which are independent or were chosen from the aforementioned polymers of polymers which are different from each other were blended, or two sorts chosen from the aforementioned polymers of polymers which are different from each other may be allotted to a **** type or a parallel connected type Carry out and carry out melting spinning by the so-called span bond method, namely, from a spinneret, melting-spin, cool and a taking over speed is considered as a part for 2000-6000m/using claimant card rows, such as an air sucker. After **[a towage and]-izing, it can open using a opening machine and a span bond non-** web can be easily obtained a uptake and by making it deposit on the uptake side where it moves. In this case, compound spinning is carried out using two or more sorts of polymers of the non-compatibility chosen from the polymer mentioned above, and if the technique of making it into the **** fiber which creates a non-** web similarly, performs mechanical **** processing to the obtained non-** web, and is having mentioned above from each polymer independent is adopted, the span bond non-** web of a super-thin continuous glass fiber can be obtained more easily. In addition, although it has the melting point almost equivalent as two or more sorts of polymers of this non-compatibility, the polymer which differs in at least 20 degrees C of the melting points can also be chosen mutually. It is desirable that face to carry out melting spinning by the span bond method, and the melt-flow-rate value measured at the temperature of 200 degrees C as the aforementioned aliphatic polyester system polymer according to ASTM-D-1238(L) adopts 20g / 100g / thing for 10 or less minutes 10 minutes or more. Since the nonwoven fabric [that the viscosity of a polymer is high] obtained by elapsing will become the thing of a hard feeling if this melt-flow-rate value is 20g / less than 10 minutes, if a melt-flow-rate value, on the other hand, exceeds 100g / 10 minutes, the viscosity of a polymer is too low, and since the high-speed silk manufacture nature at the time of a melt spinning falls, neither is desirable. Moreover, it is good to

consider the taking over speed as a part for 2000-6000m/, if the mechanical property or dimensional stability of a web which are obtained since the degree of molecular orientation of spinning fiber will not fully increase if a taking over speed is the following by 2000m/do not improve but a taking over speed, on the other hand, exceeds a part for 6000m/, the silk manufacture nature at the time of a melt spinning falls, and neither is desirable.

[0009] It is desirable to perform partial heat pressure-welding processing to the obtained non-** web in a span bond nonwoven fabric for the purpose of the enhancement in the mechanical property and dimensional stability. It faces performing partial heat pressure-welding processing to a web, and well-known technique can be adopted. For example, it is the technique of forming a punctiform weld zone between continuous glass fibers using the heated embossing roller and the metal roller with a smooth front face. The continuous glass fibers which exist in the embossing pattern section using the heated embossing roller are faced carrying out a heat pressure welding partially. Each pressure-welding point area of a heat embossing roller By circular conversion, 0.1-1.0mm 2 and the rate of pressure-welding area They are 4 - 20%, and a pressure-welding point density 2-80 points/cm preferably two to 30% 2 It is 2 4-60 points/cm preferably. It carries out and, for the rate of pressure-welding area, less than 2% or a pressure-welding point density is 2 two points/cm. Since there are too few heat adhesion regions when it is the following The mechanical strength, the gestalt hold nature, and dimensional stability of a nonwoven fabric fall, and, on the other hand, the rate of pressure-welding area exceeds 30%, or a pressure-welding point density is 2 60 points/cm. Since a nonwoven fabric will make it upright and flexibility will be spoiled if it exceeds, neither is desirable. Moreover, usually, it is desirable to consider as temperature lower about 5-40 degrees C than the melting point of the aliphatic polyester system polymer using roller temperature, and the adhesive power between continuous glass fibers is high by choosing this temperature suitably, namely, a mechanical strength is excellent, and the nonwoven fabric which is moreover rich in flexibility can be obtained. The embossing pattern of a heat embossing roller is not limited especially if the rate of pressure-welding area is within the limits which is 2 - 30%, and it is good in arbitrary configurations, such as a round shape, an elliptic type, a ** type, a trigonum type, a T character type, and a ** type. In addition, partial heat pressure-welding processing using this heat embossing roller may be any of a continuous process or another process.

[0010] As for the biodegradability thermoplasticity synthesis continuous-glass-fiber nonwoven fabric layer in this invention, it is good for it to be obtained by the process which was mentioned above and to make preferably 1.0 deniers or more 8.0 deniers or less of the single fiber fineness of the configuration fiber into 2.0 deniers or more 5.0 deniers or less. Laminating non-******** excellent in a mechanical property and dimensional stability can be obtained by making single fiber fineness into 1.0 deniers or more 8.0 deniers or less.

[0011] the biodegradability thermoplasticity synthesis continuous-glass-fiber nonwoven fabric layer in this invention -- the eyes injuries 10-70g/m2 it is -- a thing is desirable 10g of eyes injuries/, and m2 When it is the following, the grade of the precise lap of fiber is low, and since the layer indirect arrival force of laminating non-******** which carries out the laminating and unification of the natural fiber nonwoven fabric, and is obtained falls to this nonwoven fabric or conditions are inferior, it is not desirable. On the other hand, it is 70g of eyes injuries/, and m2. As a material in the field which it will become difficult to apply to a field as which it is large thin too much, and laminating non-******** obtained is required of flexibility if it exceeds, or contacts the direct skins, such as for example, the medicine and hygienic goods, and life relation material Since a working speed is made late or the need for facing performing weld processing using ultrasonic weld equipment, and unifying, and supplying great ultrasonic energy etc. arises after stimulating the skin and carrying out the laminating of the natural fiber nonwoven fabric to this nonwoven fabric moreover, when it is used, it is not desirable.

[0012] next, although the natural fibers in this invention come out about the nonwoven fabric layer which comes to carry out a confounding mechanically, the natural fiber which constitutes this nonwoven fabric layer also includes the various regeneration staple fibers represented by the animal fibers, such as a ramie, the silk staple fiber, the natural pulp, and rayon other than cellulosic fibers, such as cotton fiber and hemp fiber In this invention, the comber yarn with which it exposes and a manipulation is not given as a start raw material of this nonwoven fabric layer, and the various recovered wool which was exposed and processed and which exposes and is obtained from a gossypium or textiles, and knitting can also be used. When using recovered wool as a start raw material, as a rag shaker which can be used effectively, a ****** machine, a knot breaker, a garnet machine, and a **** machine are mentioned. Although they are based also on the size of **** configurations, such as textiles, knitting, etc. by which recovered wool is carried out, or the yarn to constitute, or the strength of a twist, if the same rag shaker is connected with two or more sets serial or the modality and combination of the rag shaker to use are used combining two or more sorts of rag shakers, they are more effective, As for ****** (%) by this rag shaker, it is desirable that it is 30 - 95% of a domain. If this ****** is less than 30%, since non-**** fiber exists in a card web If ******** not only arises on a nonwoven fabric front face, but natural fibers are faced giving a three-dimensions-mechanical confounding for example, by hyperbaric-pressure liquid pillar-shaped style processing, and a hyperbaric-pressure liquid pillar-shaped style does not penetrate a non-**** fiber fraction enough but ****** exceeds 95% on the other hand In laminating non-******** which carries out a laminating and unification with the aforementioned biodegradability thermoplasticity synthesis continuous-glass-fiber nonwoven fabric, and is obtained, sufficient skin-friction intensity is not obtained but neither is desirable. In addition, it is asked for ****** (%) here by the following formula (1).

****** (%) =(recovered wool-ed weight-****** weight) x100 / recovered wool-ed weight .. (1)

[0013] The natural fiber nonwoven fabric layer in this invention consists of the aforementioned natural fiber, and fiber comes to carry out a confounding mechanically. That is, it is desirable when using laminating non-******** which natural fibers carry out a confounding mechanically by hyperbaric-pressure liquid pillar-shaped style processing or needle punching

processing, especially in the case of the former carries out a laminating and unification with the aforementioned biodegradability thermoplasticity synthesis continuous-glass-fiber nonwoven fabric in order for flexibility to also improve, while fiber carries out a confounding in three dimensions and the loft of a nonwoven fabric improves, and is obtained as a material for the object for sanitation material, or life relation material. This nonwoven fabric layer can use as a start raw material the thing with which it comes to mix the single material or two or more sorts of materials which were chosen from the aforementioned natural fiber materials, can create the card web of predetermined scale-division attachment using a carding machine, and can obtain it easily by giving a mechanical confounding between fiber to the web subsequently obtained by hyperbaric-pressure liquid pillar-shaped style processing or needle punching processing. The semi random web arranged to the web to which cross RAID of the parallel web which could choose this card web variously by the array degree of configuration fiber, for example, was arranged in the advance orientation of a carding machine, and the parallel web was carried out, the random web arranged at random, or both degree of middle is mentioned. Moreover, it is desirable to use the card web from which the length / horizontal ratio of the strong force [nonwoven fabric] become 1/1 in general to aim at expansion as a material for garments.

[0014] the nozzle it is 0.1-0.4mm especially 0.05-1.5mm in [whose] hyperbaric-pressure liquid pillar-shaped style processing (for example, an aperture) -- a hole -- using the equipment which arranged many spacings in one train or two or more trains by 0.05-5mm, an injection pressure injects the hyperbaric-pressure liquid of 5-150kg[/cm]2 G from the aforementioned nozzle, and the technique of giving a three-dimensions-confounding between fiber is adopted by making it collide with the card web laid on the porous support member The array of a nozzle is arranged in the shape of a train in the orientation which intersects perpendicularly with the advance orientation of this card web. As a hyperbaric-pressure liquid, the water or warm water of ordinary temperature can be used. As for the distance between a nozzle and a web, it is good to be referred to as 1-15cm. If the conditions of the nonwoven fabric obtained by this processing will be confused if this distance is less than 1cm, and this distance exceeds 15cm on the other hand, impulse force when a liquid style collides with a web declines, and a three-dimensions-confounding is not fully given, but neither is desirable. Processing by this hyperbaric-pressure liquid pillar-shaped style is as good as another ****** in at least 2 phases. That is, as processing of the 1st phase, a pressure blows off, makes the hyperbaric-pressure liquid style of 5-40kg[/cm]2 G collide with the aforementioned web, and carries out the confounding of the configuration fiber of a web preparatorily. When the confounding of the configuration fiber of a web cannot be preparatorily carried out if the pressure of a liquid style is under 5kg[/cm]2 G, the pressure of a liquid style exceeded 40kg[/cm]2 G, it blows off to a web and a hyperbaric-pressure liquid style is made to collide with it in processing of this 1st phase on the other hand Since the configuration fiber of a web is confused by operation of a liquid style and turbulence and the scale-division attachment spots of conditions arise in a web, neither is desirable. Then, a pressure blows off, makes the hyperbaric-pressure liquid style of 50-150kg[/cm]2 G collide with the aforementioned web, carries out the confounding of the configuration fiber of a web in three dimensions, and makes it unify precisely collectively as processing of the 2nd phase. In processing of this 2nd phase, the three-dimensions-confounding between fiber which was mentioned above when the pressure of a liquid style was under 50kg[/cm]2 G cannot fully be formed, and, on the other hand, the loft and flexibility of a nonwoven fabric which will be acquired if the pressure of a liquid style exceeds 150kg[/cm]2 G do not improve, but neither is desirable. In addition, the nonwoven fabric to which fiber carried out the confounding of the front reverse precisely can be obtained by processing again on the same conditions as processing of the 2nd phase from a side contrary to the processing side of the 2nd phase as processing of the 3rd phase by scale-division attachment of a web following on processing of the 2nd phase. As a porous support member which supports the aforementioned web faced and used for performing hyperbaric-pressure liquid pillar-shaped style processing, the mesh screens, perforated plates, etc., such as a product made from a wire gauze of 20-100 meshes or a product made from synthetic resin, will not be limited, for example, especially if a hyperbaric-pressure liquid style may penetrate a web. Moreover, if it is desirable that they are 20 / 25mm - 200 / the domain of 25mm as for the mesh configuration of a porous support member and it is 20 / less than 25mm If fiber passes the mesh screen with a pillar-shaped style, defluxion of fiber occurs and 200 / 25mm are exceeded on the other hand when a hyperbaric-pressure liquid pillar-shaped style collides with a web The amount of energy required for a hyperbaric-pressure liquid pillar-shaped style to pass a web and the mesh screen becomes great, a production cost goes up, and neither is desirable. After performing hyperbaric-pressure liquid style processing, superfluous moisture is removed from the aforementioned web after processing. It faces removing this superfluous moisture and well-known technique can be adopted. For example, superfluous moisture can be removed somewhat mechanically using drawing equipments, such as a mangle roll, residual moisture can be succeedingly removed using dryers, such as a hot blast circulating dryer of a suction band method, and a nonwoven fabric can be obtained.

[0015] The natural fiber nonwoven fabric layer in this invention is the eyes injuries 30-200g/m2. It is 50-150g/m2 preferably. It is good that it is a thing. 30g of eyes injuries/, and m2 When it is the following, the abundance per unit area of a natural fiber is too small, the target absorptivity does not fully possess, but, on the other hand, this invention is 200g of eyes injuries/, and m2. When it exceeds, after the laminating with the aforementioned biodegradability thermoplasticity synthesis continuous-glass-fiber nonwoven fabric ultrasonic weld equipment By using and forming a punctiform weld zone, in laminating non-******** obtained by unifying, the sublation strong force does not fully improve, but neither is desirable.

[0016] Next, laminating non-******** of this invention is explained. It comes to unify laminating non-******** of this invention collectively by being fixed, where the laminating of the aforementioned biodegradability thermoplasticity synthesis continuous-glass-fiber nonwoven fabric layer and the natural fiber nonwoven fabric layer is carried out, and it has the

punctiform weld zone where it comes to weld the aforementioned synthetic continuous glass fiber and a natural fiber and the natural fiber of both the aforementioned nonwoven fabrics layer located in an interface at least is laid under the synchysis section of the aforementioned synthetic continuous glass fiber in the aforementioned punctiform weld zone. It is formed using the ultrasonic weld equipment with which a frequency consists of a ultrasonic wave oscillator which is about 19.5kHz, and which is usually called a horn, and a pattern roll which possesses a convex height in punctiform or band-like on a periphery, and the continuous glass fibers which contact the fraction applicable to the aforementioned convex height are made to weld to this punctiform weld zone. This punctiform weld zone receives a non-******** all surface area still in detail. A specific field and specific arrangement the ratio [as opposed to / although it is necessary to have and not each punctiform weld zone necessarily needs to be a circular configuration / a non-******** all surface area] of the area of an all-points-like weld zone -- 2 - 40% -- desirable -- 4 - 25%, and this zone density -- 7-80 point/cm2 -- desirable -- 8-50 point/cm2 it is -- a thing is good If the ratio of the area of an all-points-like weld zone to a non-******** all surface area is less than 2% By using ultrasonic weld equipment and forming a punctiform weld zone after the laminating of the aforementioned biodegradability thermoplasticity synthesis continuous-glass-fiber nonwoven fabric and a natural fiber nonwoven fabric If the sublation strong force does not fully improve in laminating non-******** obtained by unifying but the ratio of the aforementioned area exceeds 40% on the other hand, since the flexibility and the loft of laminating non-******** which are obtained will fall, neither is desirable. Moreover, this zone density is 2 seven points/cm. In the case of that spots arise, the layer indirect arrival force, i.e., the sublation strong force, of laminating non-******** acquired if it is the following, ****, or a **** span bond nonwoven fabric, bacterium barrier nature falls, and, on the other hand, this zone density is 2 80 points/cm. If it exceeds, the flexibility and the loft of laminating non-******** which are obtained fall, and neither is desirable.

[0017] The ultrasonic weld equipment which can be used in this invention is equipment with which it consists of a ultrasonic wave oscillator which is about 19.5kHz, and which is usually called a horn, and a pattern roll which possesses a convex height in punctiform or band-like on a periphery, well-known equipment, i.e., frequency. The aforementioned pattern roll is arranged by the lower part of the aforementioned ultrasonic wave oscillator, and it lets a processed material pass between a ultrasonic wave oscillator and a pattern roll. The convex height arranged by this pattern roll may be one train or two or more trains, and when the arrangement is two or more trains, a parallel or which an alternate type array is sufficient as it. In case of weld processing, a pneumatic pressure is impressed and pressurized at a horn. If the linear pressure between a horn and a pattern roll is usually carried out in 1-10kg/cm and a linear pressure is less than 1kg/cm If push to the laminated material of the aforementioned thermoplastic synthesis continuous-glass-fiber nonwoven fabric layer and a natural fiber nonwoven fabric layer, ** is insufficient, weld does not arise and a linear pressure exceeds cm in 10kg /on the other hand The layer indirect arrival force of laminating non-******** obtained by the aforementioned biodegradability thermoplasticity synthesis continuous-glass-fiber nonwoven fabric layer to a punctiform weld zone which pushes, and ** is too high and is equivalent to a weld zone pyrolyzing, or a punch arising in being extreme declines, and neither is desirable. By performing weld processing using the ultrasonic weld equipment mentioned above in the laminated material of the aforementioned biodegradability thermoplasticity synthesis continuous-glass-fiber nonwoven fabric and a natural fiber nonwoven fabric, in a punctiform weld zone, it is fixed where the natural fiber of both the aforementioned nonwoven fabrics layer located in an interface at least is laid under the synchysis section of the aforementioned synthetic continuous glass fiber, and laminating non-******** of this invention is unified collectively. Drawing 1 is a ** type view showing the cross section of the aforementioned punctiform weld zone in laminating non-******** of this invention. The biodegradability thermoplasticity synthesis continuous-glass-fiber layer which dissolved 1 in the punctiform weld zone in drawing, and 2 are natural fibers. It sets to a punctiform weld zone so that clearly from this drawing. the natural fiber 2 of both the nonwoven fabrics layer located in an interface at least It is fixed in the status that it was laid under the synchysis section, 1 [i.e.,], which the thermoplastic synthesis continuous glass fiber dissolved, and since both the nonwoven fabrics layer has such a bonded structure in a punctiform weld zone, it becomes high laminating non-******** of the sublation strong force.

[0018]

[Function] Since one side consists of a nonwoven fabric layer which consists of a biodegradability thermoplasticity synthesis continuous glass fiber, it has a hydrophobic property, since other sides consist of a nonwoven fabric layer natural fibers come to carry out a confounding mechanically, it has absorptivity, and moreover, as for laminating non-******** of this invention, a double-sided nonwoven fabric has a biodegradability. Moreover, in the punctiform weld zone where it comes to weld the aforementioned synthetic continuous glass fiber and a natural fiber, since it has the bonded structure fixed where the natural fiber of both the aforementioned nonwoven fabrics layer located in an interface at least is laid under the synchysis section of the aforementioned synthetic continuous glass fiber, it becomes high laminating non-******** of the sublation strong force.

[0019]

[Example] Next, although this invention is concretely explained based on an example, this invention is not limited at all by these examples. In the example, each weighted solidity was measured by the following technique.

Melt-flow-rate Value (g / 10 minutes): According to the technique of a publication, it measured to ASTM-D-1238(L). In addition, in the case of the biodegradability thermoplasticity aliphatic polyester system polymer, measurement temperature was made into 200 degrees C.

melting point (**): -- temperature which gives the maximum extremal value of the synchysis endothermic curve which measured 5mg and the programming rate as a part for 20 degrees-C/, and obtained the sample weight was made into the melting point (**) using the differential scanning type calorimeter DSC-2 type made from par **********

Scale-division Attachment (g/m2): After having created a total of ten test pieces 10cm long and 10cm wide from the sample of reference condition and making it result in an equilibrium moisture, weighing capacity of the weight (g) of each test piece was carried out, the average of the acquired value was converted into per [a unit area (m2)], and it considered as scale-division attachment (g/m2).
It pulled and measured according to powerful (kg / 5cm width of face) and technique given in tension ductility (%):JIS-L-1096A. Namely, create a total of ten test pieces whose sample width of face sample length is 10cm and is 5cm, and a nonwoven fabric passes for every test piece, pull about orientation using a constant-rate-of-extension type tension tester (Oriental Baldwin tensilon UTM- 4 -1 -100), and it elongates by part for 10cm/in speed. The average of a load value (kg / 5cm width of face) was pulled at the time of the obtained disconnection, the average of the rate (%) of extension was pulled at the time of powerful (kg / 5cm width of face) and a disconnection, and it considered as ductility (%).
A total of ten test pieces whose sample width of face Interlaminar-peeling Powerful (g/5cm width of face):sample length is 10cm, and is 5cm is created, and a nonwoven fabric passes for every test piece, about orientation a constant-rate-of-extension type tension tester (Oriental Baldwin tensilon UTM-4 -1 -100) the average of the load value (g/5cm width of face) which uses and pulls, a natural fiber nonwoven fabric layer measures from the edge of the laminated-structure field from a synthetic continuous-glass-fiber nonwoven fabric layer by part for 10cm/in speed, is made to exfoliate compulsorily to the position of 5cm, and was acquired -- an interlaminar peeling -- it was presupposed that it is powerful (g/5cm width of face)
Bending-resistance (g): A total of five test pieces whose sample width of face sample length is 10cm and is 5cm was created, and it bent in longitudinal direction for every test piece, and considered as the cylinder-like object, and what joined the edge respectively was made into the bending-resistance measurement sample. Subsequently, it compressed by part for 5cm/of compression velocities about the shaft orientations for every measurement sample using the constant-rate-of-extension type tension tester (Oriental Baldwin tensilon UTM- 4 -1 -100), and the average of the acquired maximum-load value (g) was made into the bending resistance (g).
Absorptivity (mm) According to the Bally Lec method of a publication, it measured to JIS-L-1096.
It took out, after laying the evaluation:test piece of a biodegradability underground for three months into soil, and when a test piece holds the gestalt and is, or when it pulled even if it held the gestalt, and the strong force was falling to 50% or less of the first stage, the biodegradability estimated that it was good.
[0020] The span bond nonwoven fabric which the melt-flow-rate value which the example 1 melting point measured at 59 degrees C and the temperature of 200 degrees C becomes from the continuous glass fiber of the aforementioned polymer using the Polly epsilon-caprolactone chip which are 25g / 10 minutes was created. 230 degrees C and a solitary-foramen flow rate are considered [the spinneret which has a hole] for through spinning temperature as a part for 0.78g/. namely, the circular cross-section spinning whose aperture melting of the aforementioned polymer chip is carried out using an extruder type melting extruder, and is 0.35mm about this -- After it carries out melting spinning and temperature cools using the cooling wind which is 20 degrees C, a taking over speed is considered as a part for 3500m/using an air sucker. After **[a towage and]-izing, a opening machine the web which is made to do a uptake and the deposition of, considers as a web on the uptake side where it uses, opens and moves, and was obtained -- point area -- 0.6mm2 the letter sculpture [of a salient] encaustic section -- 17% of the rates of pressure-welding area, and density 36 point/cm2 the arranged heat embossing roller and a front face -- a smooth metal roller It uses, and a linear pressure is used in 40kg/cm, being used processing temperature as 57 degrees C, partial heat pressure-welding processing is performed by part for 10m/of working speeds, and single fiber fineness is 30g of eyes injuries/, and m2 at 2.0 deniers. The span bond nonwoven fabric was obtained. The obtained span bond nonwoven fabric was that 25g and whose absorptivity 50% and a bending resistance are [the tension strong force] 17mm for 5.1kg / 5cm width of face, and tension ductility. Separately, cotton fiber created the nonwoven fabric which comes to carry out a confounding in three dimensions using cotton ****** whose mean fiber length mean single fiber fineness is 1.5 deniers, and is 25mm. That is, it exposed the account of a front, the gossypium was used as the start raw material, the fiber array created the random card web by the random carding machine, it laid on the wire gauze of 70 meshes which moves the web subsequently obtained by part for 20m/of traveling speeds, and hyperbaric-pressure liquid style processing was performed. hyperbaric-pressure liquid style processing -- the nozzle of 0.1mm of apertures -- a hole -- another **** pillar-shaped stream was made to act on two phases from the position of 50mm of the upper parts of a web at the spacing of 0.6mm using the hyperbaric-pressure pillar-shaped stream processor arranged in the single tier The pressure was set to 30kg[/cm]2 G in processing of the 1st phase, and the pressure was set to 70kg[/cm]2 G in processing of the 2nd phase. In addition, after performing processing of the 2nd phase 4 times from the side front of a web first, it inverted the web, and it was performed 5 times from the background. Subsequently, 35g of eyes injuries/and m2 to which the hot air drying equipment was used for the obtained processing object, xeransis processing was performed on conditions with a temperature of 100 degrees C, and cotton fiber carried out the three-dimensions-confounding precisely after removing superfluous moisture from the obtained processing object using a mangle roll The cotton fiber nonwoven fabric was obtained. The obtained cotton fiber nonwoven fabric was that 28g and whose absorptivity 35% and a bending resistance are [the tension strong force] 132mm for 4.5kg / 5cm width of face, and tension ductility.
[0021] It ranks second. The span bond nonwoven fabric and cotton fiber nonwoven fabric which were obtained above The ultrasonic weld equipment which consists of a pattern roll with which a laminating is carried out and the convex height was arranged by punctiform by 2 on the ultrasonic wave oscillator whose frequency is 19.5kHz, and the periphery 11% (ratio of the area of all convex heights to a roll all surface area) of surface ratio, and 18 densities/cm It used, and the working speed

was set as a part for 30m/, the amplitude of 1.5kg [cm] /and a ultrasonic wave was set to 16 micrometers for the linear pressure, ultrasonic weld processing was performed, and laminating non-******** was obtained. The property of obtained laminating non-******** is shown in Table 1.

[0022] The span bond nonwoven fabric which the melt-flow-rate value which the example 2 melting point measured at 101 degrees C and the temperature of 200 degrees C becomes from the continuous glass fiber of the aforementioned polymer using the Polly beta-propiolactone chip which are 25g / 10 minutes was created. 250 degrees C and a solitary-foramen flow rate are considered [the spinneret which has a hole] for through spinning temperature as a part for 0.78g/. namely, the spinning whose aperture melting of the aforementioned polymer chip is carried out using an extruder type melting extruder, and is 0.35mm about this -- After it carries out melting spinning and temperature cools using the cooling wind which is 20 degrees C, a taking over speed is considered as a part for 2400m/using an air sucker. A linear pressure is used in 40kg/cm using a smooth metal roller, being used processing temperature as 95 degrees C. the heat embossing roller which opened using the opening machine, was made to deposit, made the web and was used in the example 1 on the uptake side where it moves at the uptake and the obtained web after **[a towage and]-izing, and a front face -- Partial heat pressure-welding processing is performed by part for 10m/of working speeds, and single fiber fineness is 30g of eyes injuries/, and m2 at 2.0 deniers. The span bond nonwoven fabric was obtained. The obtained span bond nonwoven fabric was that 28g and whose absorptivity 52% and a bending resistance are [the tension strong force] 16mm for 5.3kg / 5cm width of face, and tension ductility. Subsequently, the laminating of the cotton fiber nonwoven fabric created in the span bond nonwoven fabric obtained above and the example 1 was carried out, and laminating non-******** was obtained like the example 1 henceforth. The property of obtained laminating non-******** is shown in Table 1.

[0023] The span bond nonwoven fabric which consists of a continuous glass fiber of the aforementioned polymer was created using the polypropylene chip whose melt-flow-rate values the example of comparison 1 melting point is 156 degrees C, and are 50g / 10 minutes. That is, except having carried out melting of the aforementioned polymer chip using the extruder type melting extruder, and having made spinning temperature into 230 degrees C henceforth, single fiber fineness is 2.0 deniers like an example 1, and it is 30g of eyes injuries/, and m2. The span bond nonwoven fabric was obtained. The obtained span bond nonwoven fabric was that 38g and whose absorptivity 38% and a bending resistance are [the tension strong force] 10mm for 7.0kg / 5cm width of face, and tension ductility. Subsequently, the laminating of the cotton fiber nonwoven fabric created in the span bond nonwoven fabric obtained above and the example 1 was carried out, and laminating non-******** was obtained like the example 1 henceforth. The property of obtained laminating non-******** is shown in Table 1.

[0024] A linear pressure is used in 80kg/cm using a smooth metal roller, being used processing temperature as 50 degrees C. the heat embossing roller and front face whose rate of pressure-welding area the laminating of the cotton fiber nonwoven fabric created in the span bond nonwoven fabric created in the example of comparison 2 example 1 and the example 1 is carried out, and is 12% instead of ultrasonic weld processing -- Laminating non-******** was obtained like the example 1 except having performed partial heat pressure-welding processing by part for 15m/of working speeds. The property of obtained laminating non-******** is shown in Table 1.

[0025]

[Table 1]

表 1

		実施例		比較例	
		1	2	1	2
目付け	g / m²	65	65	65	65
引張り強力 経方向	kg / 5cm幅	7.3	7.8	11.5	7.1
引張り伸度 経方向	%	43	41	38	45
層間剝離強力	g / 5cm幅	150	160	240	38
剛軟度	g	71	75	88	260
生分解性	—	良好	良好	不良	良好

[0026] It was what is high as for the sublation strong force, and possesses a biodegradability while laminating non-******** obtained in the examples 1 and 2 has practically sufficient tension strong ductility so that clearly from Table 1. On the other hand, laminating non-******** obtained in the example 1 of a comparison does not contain biodegradability fiber, but was estimated that a biodegradability is inferior as a result of the aforementioned evaluation examination. Since partial heat pressure-welding processing in which the heat embossing roller was used for laminating non-******** obtained in the example 2 of a comparison was performed, the sublation strong force was very low.

[0027]

[Effect of the Invention] The biodegradability thermoplasticity synthesis continuous-glass-fiber nonwoven fabric layer and

natural fibers of the aforementioned specialization carry out the confounding of the biodegradability laminating non-******** of this invention mechanically. The laminating of the becoming nonwoven fabric layer is carried out, have the punctiform weld zone where it comes to weld the aforementioned synthetic continuous glass fiber and a natural fiber, and it sets to the aforementioned punctiform weld zone. It is the thing which it comes to unify collectively by being fixed where the natural fiber of both the aforementioned nonwoven fabrics layer located in an interface at least is laid under the synchysis section of the aforementioned synthetic continuous glass fiber. It is and has a biodegradability, and the sublation strong force is high, and it has absorptivity and a hydrophobic property collectively, and is suitable as each material for the medicine and hygienic goods, and the industrial materials that wipe off and are represented by general life relation material or the objects for agriculture, such as cloth, and a wrapping, home use or a bag for raw dust uptakes for business.

[Translation done.]